SDI-12 Adapter Kit for Manta2 Multiprobes

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The Eureka Manta2 SDI-12 Adapter Kit lets you connect your Manta2 multiprobe to any SDI-12 controller.

SDI-12, an acronym for serial data interface, 1200 baud, is a communication protocol peculiar to environmental monitoring. In theory, any SDI-12 sensors (including multiprobes) can transfer data upon request to any SDI-12 controller (such as a data logger or telemetry system).

When you power-up your SDI-12 controller, it supplies power to the Manta2 and reads the Manta2's sensor configuration. This is how the controller knows how to parse and label the data coming from the Manta2, and how much delay to allow before requesting measurements.

The Manta2 SDI-12 Adapter (shown below) has one male D-Sub-9 connector that mates to the Manta2 through your PC's Serial Adapter Cable, and a 3-wire SDI-12 "pigtail" to connect to your SDI-12 controller.

1)   Changing the Manta2 SDI-12 Adapter's Address

The default address is "0" for the Manta2 SDI-12 Adapter. The SDI-12 standard allows for addresses 0 through 9, for up to ten devices connected to the same SDI-12 host (via the 3-wire connections). You can change the SDI-12 Adapter's SDI-12 address using the 4-position dipswitch on the circuit board, as shown in the picture below. The picture shows the default SDI-12 address of "0", where all of the switches are in the OFF position (the position away from the word "ON" printed on the switch). To change the address, use the following switch positions:

Address	Switch Position			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON

(ALL other switch combinations will be interpreted as Address "0").
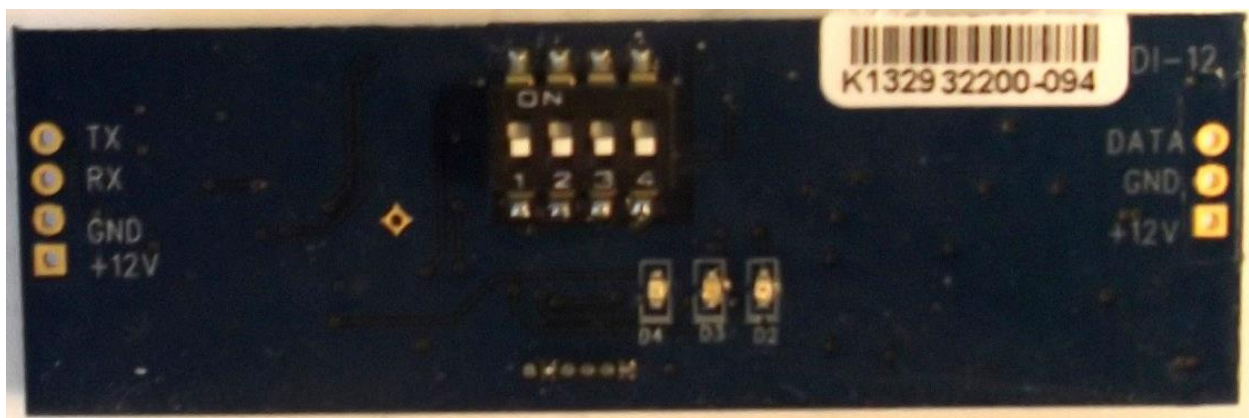
2)   Connecting the SDI-12 Adapter to Your Controller

By controller we mean data logger, PLC, etc.:

a) Before powering the Manta2, use an Underwater Cable (or Data Cable in the lab) to connect the multiprobe to the SDI-12 Adapter.
b) Connect the SDI-12 Adapter's three 3 wires to your controller as follows:

> red – power (~+6 VDC to +12 VDC)
> black – ground
> green – SDI-12 (data)

c) Once you power-up your SDI-12 controller, you are ready to take data according to the configuration you set for the controller.

3)   Basic SDI-12 Commands

Eureka has implemented all basic SDI-12 commands (see below) and selected extended commands. However, the Manta2 cannot be configured or calibrated via the SDI-12 adapter – those functions must be done either through the standard Manta2 Control software (which is way easier to use than the SDI-12 protocol).

In the most common use of these commands, the sequence of commands issued (assuming address "0") is:

1) 0!   (verify communication with the device on address 0)
2) 0M!   (start a measurement on device with address 0)
3) 0D0!   (return the first set of measurements)
4) 0D1!   (return the next set of measurements, if necessary)
5) etc.

Step (2) will return a value such as "00346", which is interpreted as follows:

a) The first "0" is just echoing the address "0", the address of the device that responds.
b) "34" indicates the number of seconds to wait before issuing the 0D0! command, which will retrieve the measurements.
c) "6" indicates that 6 parameters will be returned. Note that all parameter might not fit into the data stream all at once, so that subsequent 0Dx! commands may have to be issued to obtain the remaining parameter data, where "x" is a value from "0" to "9".

Name	Command	Response
Break	Continuous Spacing for at least 12 milliseconds	None

Acknowledge Active	a!	a<CR><LF>
Send Identification	aI!	allccccccccmmmmmmvvvxxx...xx<CR><LF>
Change Address	aAb!	b<CR><LF> (support for this command is required only if the sensor supports software changeable addresses)
Address Query	?!	a<CR><LF>
Start Measurement	aM!	atttn<CR><LF>
Start Measurement And Request CRC	aMC!	atttn<CR><LF>
Send Data	aD0!	a<values><CR><LF> or a<values><CRC><CR><LF>
	.	a<values><CR><LF> or a<values><CRC><CR><LF>
	.	a<values><CR><LF> or a<values><CRC><CR><LF>
	.	a<values><CR><LF> or a<values><CRC><CR><LF>
	aD9!	a<values><CR><LF> or a<values><CRC><CR><LF>
Additional Measurements	aM1!	atttn<CR><LF>
	.	atttn<CR><LF>
	.	atttn<CR><LF>
	.	atttn<CR><LF>
	aM9!	atttn<CR><LF>
Additional	aMC1! ... aMC9!	atttn<CR><LF>

Measurements And Request CRC		
Start Verification	aV!	atttn<CR><LF>
Start Concurrent Measurement	aC!	atttnn<CR><LF>
Start Concurrent Measurement and Request CRC	aCC!	atttnn<CR><LF>
Additional Concurrent Measurements	aC1!	atttnn<CR><LF>
	.	atttnn<CR><LF>
	.	atttnn<CR><LF>
	.	atttnn<CR><LF>
	aC9!	atttnn<CR><LF>
Additional Concurrent Measurements and Request CRC	aCC1!...aCC9!	atttnn<CR><LF>
Continuous Measurements	aR0! ... aR9!	a<values><CR><LF> (formatted like the D
Continuous Measurements and Request CRC	RC0! ... aRC9!	a<values><CRC><CR><LF> (formatted like the D commands)

Please consult the SDI-12.org manual for more information on these commands.

4)   Using the "Isco-Friendly" command with a Manta2.

An extended SDI-12 command introduced by Isco is the aXPR0! Command. This command may be useful to some, in that it returns the order of parameters as selected for the Manta2, without the user having to know the order before hand. The response will be in the form of aF1F2F3 … <CR><LF>, where F1, F2, etc. are two-character codes indicating the order of the parameters and their units that will be returned in the Manta2 data string. Of course, additional programming will have to be done on the host to interpret this command response.

The F-codes are unique to Isco; here are the most commonly used codes:

A0 is temperature in degrees C
A1 is temperature in degrees F
B0 is conductivity in mS/cm
B1 is conductivity in uS/cm
C0 is specific conductance in mS/cm
C1 is specific conductance in uS/cm
D0 is total dissolved solids in g/l
E0 is salinity in ppt
F0 is dissolved oxygen in mg/l
G0 is pH in units
H0 is ORP in mV
I0 is level in m
I1 is level in feet
J0 is ammonium-nitrogen in mgN/l
K1 is ammonia-nitrogen in mgN/l
L0 is nitrate-nitrogen in mgN/l
M0 is turbidity in NTU
N0 is chloride in mg/l
O0 is chlorophyll in ug/l

Problems? No problem. E-mail us at support@waterprobes.com or call 512-302-4333, Ext 1111.